

Allergic reactions to rubber condoms

M RADEMAKER, A FORSYTH

From the Contact Dermatitis Investigation Unit, Belvidere Hospital, Glasgow, Scotland

SUMMARY With the increased use of condoms, contact dermatitis to rubber is being seen more often. To develop a rubber condom suitable for use by rubber sensitive people, a "hypoallergenic" condom, which is washed in ammonia to reduce the residues of rubber accelerators, has been manufactured.

Fifty patients allergic to various rubber accelerators were patch tested with an ordinary condom and the new washed condom. Fifty patients undergoing routine patch test investigation who were not allergic to rubber were also tested as controls. Twenty two of the rubber sensitive patients had a positive reaction to the new rubber condom compared with four of the control patients.

Washing rubber condoms in ammonia does not appear to reduce the residues of rubber accelerators sufficiently for their use by rubber sensitive people. A non-allergenic condom is required.

Contact dermatitis to rubber compounds is not uncommon and accounts for 5-10% of positive patch test results.¹⁻⁴ Rubber latex itself rarely gives rise to problems; the responsible allergen is usually one of the many chemicals added during the manufacturing process, such as accelerators or antioxidants, with the result that products made from synthetic rubbers cause contact reactions as often as products made from natural rubber.

Patients with contact dermatitis to rubber are generally sensitised to rubber by contact with rubber gloves or footwear, although the list of products containing rubber is long. Contact dermatitis to rubber condoms is recognised, although not many reports have been published.^{5,6} Many instances are probably missed because either the patient is too embarrassed to suggest the possibility or because the doctor has not considered it.

The increasing public awareness of the human immunodeficiency virus and AIDS and the various high profile campaigns for safer sex have resulted in an increase in the use of rubber condoms, which has been reflected in an increase in the number of contact reactions to rubber condoms seen in dermatological practice. The need for a non-allergenic or hypoallergenic condom is therefore obvious.

We assessed the value of a new, "hypoallergenic", rubber condom in a group of patients who were allergic to various rubber accelerators.

Patients and methods

The "hypoallergenic" condom was manufactured in an identical fashion and from the same raw ingredients as ordinary condoms: only at the end of the manufacturing process was the handling different. In an attempt to leach out any known sensitisers, the "hypoallergenic" condom was washed in a 5% aqueous solution of ammonia for 24 hours and then repeatedly rinsed in water.

We studied 50 rubber sensitive patients (29 women, 21 men; mean (SE) age 45 (2) (range 16-67) years). They all had a relevant history of allergy to rubber and all reacted positively to at least one of the rubber mixes in the standard European battery of patch test allergens (thiuram-mix, carba-mix, mercapto-mix, or paraphenylenediamine-mix). Most (23) had hand eczema secondary to using rubber gloves, although some (nine) had rubber footwear dermatitis. Thirty were allergic to thiuram-mix, 16 to carba-mix, and 12 to mercapto-mix. None had complained specifically of contact dermatitis to rubber condoms, although on direct questioning eight (six men and two women) did admit to possible reactions.

As controls, we used 50 patients (31 women, 19 men; mean (SE) age 39 (3) (range 10-71) years) who were undergoing routine patch testing, had no history suggestive of rubber allergy, and had negative patch test reactions to the four rubber mixes.

Each rubber sensitive and control patient was patch

Address for reprints: Dr M Rademaker, Department of Dermatology, Glasgow Royal Infirmary, Glasgow G4 0SF

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Table Contact reactions to new "hypoallergenic" (washed) condoms and ordinary condoms in rubber sensitive and control (non-sensitive) patients

	Rubber sensitive (n = 50)	Controls (n = 50)
New washed condom:		
Inner surface	6	1
Outer surface	5	0
Both surfaces	11	3
Total	22	4
Ordinary condom:		
Inner surface	3	0
Outer surface	3	1
Both surfaces	4	1
Total	10	2

tested to the inner and outer surfaces of the washed condom (without lubricant) as well as to both the inner and outer surfaces of an ordinary non-washed condom (without lubricant). Condoms, like rubber gloves, are made with two layers, so it was necessary to test both surfaces of the condom. Pieces of condom, 1 cm² in area, were placed on small aluminium discs and applied to the skin on the back of each patient and occluded for 48 hours with micropore tape, and the results were read at 48 and 96 hours.

Results

The table shows that 26 of the rubber sensitive patients reacted to one or other of the condoms (16 to the new washed condom only, four to the ordinary condom only, and six to both condoms). These reactions were all thought to be relevant. Of these 26 rubber sensitive patients, 16 were allergic to thiuram-mix, eight to carba-mix, and seven to mercapto-mix.

Of the 50 control patients, four had irritant reactions to the new washed condom and two to the ordinary non-washed condom (one was allergic to both) (table).

Discussion

Contact dermatitis to rubber is a substantial clinical problem, as 5–10% of all patients patch tested are allergic to rubber compounds.^{1–4} The incidence of contact dermatitis to rubber condoms is less well established,^{5,6} although Hindson reported 43 cases during a 10 year period at St John's Hospital.⁶ The sensitisers were tetramethylthiuram disulfide (in 28/

38), mercaptobenzothiazole (6/38), and zinc dithiocarbamate (6/19). Other sensitisers reported were non-rubber chemicals used in the lubricant or spermicide.

The thiurams are no longer used currently as accelerators in rubber used for condom manufacture, although they are often added as preservatives (at a 0.05% concentration) when the rubber latex is extracted. Condoms manufactured in this country already have low residues of carbamates (zinc dibutylthiocarbamate 0.20–0.25% and zinc diethyldithiocarbamate 0.12–0.15%), although they can still give rise to problems. To reduce these residues even further the manufacturers washed the finished condom in a 5% ammonia solution for 24 hours. This has the drawback of reducing the shelf life of the condom from 5 years to 18 months.

From the results of this study, washing the condom in ammonia is obviously insufficient for people who have already been sensitised to rubber accelerators, as 44% of the patients tested reacted to the washed condom. Reducing the residues of rubber accelerator in the condoms, however, may make them less likely to be primary sensitisers, though that may not be of much clinical benefit as most patients are sensitised initially by contact with products such as rubber gloves.

What alternatives do socially conscious rubber sensitive patients have? Non-rubber condoms, such as those made of sheep gut (in the United States of America) or polyurethane (Denmark), are available in some countries, but their imperviousness to viral particles is not known. We can therefore only hope that the rubber industry continues to look for an alternative, non-rubber or non-allergenic, condom.

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